

### **Abstract of the Disclosure**

A transmission antenna diversity method, and a base station apparatus and a mobile station apparatus therefor in a mobile communication system are provided. In the transmission antenna diversity method, channel information is measured from signals received through the plurality of antennas used in the base station, and a channel information matrix is output. The channel information matrix is transformed according to a transform matrix composed of a complex basis vector set. Reception power with respect to the plurality of antennas is calculated based on the transformed channel information matrix. Antenna selection information obtained based on the calculated reception power is transmitted to the base station as feedback information for controlling transmission antenna diversity. Therefore, power is equally distributed to transmitting antennas, excellent performance is maintained at a high speed of movement, and reliable channel adaptation is accomplished at a low speed of movement of the mobile station.